Chapter 6

TCP/IP Basics

Episode 6.01

Episode title: **Introduction to IP Addressing and Binary**

Objective: **1.7 Given a scenario, use appropriate IPv4 network addressing.**

L3s

Dotted-Decimal Notation
Each octet is valued between 0 and 255
Congratulations!
11000101 = 197
00001110 = 14
10101010 = 170

L3s

00000000 = 0
11111111 = 255
Converting 171 from decimal to binary
171 in binary is 10101011
Converting 224 from decimal to binary
224 in binary is 11100000
Converting 95 from decimal to binary
95 in binary is 01011111

Episode 6.02

Episode title: **Introduction to ARP**

Objective: **5.5 Given a scenario, use the appropriate tool or protocol to solve networking issues**

L3s

ARP (Address Resolution Protocol)

ARP resolves MAC addresses from IP addresses

Episode 6.03

Episode title: **Subnet Masks**

Objective: **1.7 Given a scenario, use appropriate IPv4 network addressing.**

L3s

Cannot use 0- 255 for the Host ID

The Subnet Mask is only used by the computer- it is never sent out

232.25.208.xxx/24

The Default Gateway will figure out where to forward the message

Fixed Length Subnet Mask (FLSM)

Variable Length Subnet Mask (VLSM)

Episode 6.04

Episode title: **Classful Addressing**

Objective: **Test goes here**

L3s

Class licenses

Class A 0-126 /8

Class B 128-191 /16

Class C 192-223 /24

Subnetting divides Network IDs into two or more networks

Subnets don’t have to be on the dots

Episode 6.05

Episode title: **Subnetting with CIDR**

Objective: **Test goes here**

L3s

Classless Inter-Domain Routing (CIDR)
160.25.208.1
(281)-555-1212
2815551212
160.25.208.1
10100000000110011101000000000001
208.25.160.0 /24

L3s

208.25.160.0 /25

208.25.160.128 /25

2 Subnets, 126 Host per Subnet

4 Subnets, 62 Hosts per Subnet

Episode 6.06

Episode title: **More CIDR Subnetting Practice**

Objective: **1.7 Given a scenario, use appropriate IPv4 network addressing.**

No L3s or QR, just subnet practicing

Episode 6.07

Episode title: **Dynamic and Static IP Addressing**

Objective: **1.4 Explain common networking ports, protocols, services, and traffic types.**

3.4 Given a scenario, implement IPv4 and IPv6 network services

L3s

Dynamic IP Address
Static IP Address
/24 = 254 Hosts
/24 = 254 Hosts
/25 = 126 Hosts
/26 = 62 Hosts
/27 = 30 Hosts

L3s

/28 = 14 Hosts
/29 = 6 Hosts
/30 = 2 Hosts
/31 = 0 Hosts
Subnet Mask
Network ID

Episode 6.07

Episode title: **Dynamic and Static IP Addressing**

Objective:

1.4 Given a scenario, configure a subnet and use appropriate IP addressing schemes

3.4 Given a scenario, implement IPv4 and IPv6 network services

5.5 Given a scenario, use the appropriate tool or protocol to

L3s

- Static (manual) assignment
- Dynamic (automatic) assignment
- Dynamic Host Configuration Protocol (DHCP)
- BOOTP in Linux
- Each broadcast domain must only have one DHCP server
- DHCP server must be run within the broadcast domain

L3s

ipconfig

ifconfig in Linux

DHCP lease time

DCHP pool/scope

IP address reservation

Exclusion ranges

Episode 6.08

Episode title: **Special IP Addresses**

Objective: **1.7 Given a scenario, use appropriate IPv4 network addressing.**

L3s

10.X.X.X
172.16.x.x - 172.31.x.x -> private IP address
192.168.x.x -> private IP address
NAT device
Loopback address
Loopback adaptor
IPv4 loopback - 127.0.0.1

L3's

IPv6 loopback - ::1

APIPA (Automatic Private IP Addressing)

APIPA - 169.254.x.x

Episode 6.09

Episode title: **IP Addressing Scenarios**

Objective: **Test goes here**

L3s

Duplicate IP address
ipconfig
ifconfig
Duplicate MAC address
Incorrect gateway
Incorrect netmask
Expired IP address